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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,552	09/30/2000	MICHAEL GINSBERG	1018.111US1	6912

22801 7590 05/07/2004

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EXAMINER

SHAH, NILESH R

ART UNIT	PAPER NUMBER
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2127

DATE MAILED: 05/07/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/676,552

Applicant(s)

GINSBERG, MICHAEL

Examiner

Nilesh R Shah

Art Unit

2127

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-22 are presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolan (4, 896,261) and further in view of Glover et al (5,379,297) (hereinafter Glover).
4. As per claim 1, Nolan teaches a machine-readable medium having a data structure stored thereon for efficiently ordering a plurality of entities, each entity having a rank within a plurality of ranks, the data structure comprising (Fig 2, col. 2 lines 22-45):

an array having a plurality of array entries over which the plurality of ranks are distributed such that each array entry has a corresponding range of ranks, at least one array entry each pointing to an entity of the plurality of entities having a greatest rank within the corresponding range of ranks for the array entry (col. 9 lines 29-40, col. 11 lines 12-20). Nolan does not specifically teach the use of a horizontally linked list.

Glover teaches a horizontally linked list linking at least a subset of the plurality of entities in at least a descending rank order direction, each entity in the horizontally linked list having a unique rank as compared to the ranks of other entities in the horizontally linked list (Fig 12-1, 12, 2, 12-3, 12-4, col. 6 lines 57-67, col. 49 line 59 –col. 50 line 13). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Glover and Nolan to ensure horizontal linked list have a unique rank. By having a unique horizontal linked list rank each list can be controlled and identified by the user to provide an more efficient system.

4. As per claim 2, Glover teaches a medium data structure: further comprising at least one vertically linked list, each vertically linked list linking in at least one direction a corresponding subset of the plurality of entities having an identical rank (Fig 12-1, 12, 2, 12-3, 12-4, col. 6 lines 57-67, col. 49 line 59 –col. 50 line 13).
5. As per claim 3, Glover teaches a medium, wherein each vertically linked list links the corresponding subset of the plurality of entities in a first vertical direction and a second vertical direction (Fig 12-1, 12, 2, 12-3, 12-4, col. 6 lines 57-67, col. 49 line 59 –col. 50 line 13)

6. As per claim 4, Nolan teaches a the data structure, further comprising a head pointer pointing to an entity having a greatest rank of the plurality of ranks of the plurality of entities (col. 9 lines 40-64).
7. As per claim 5, Nolan teaches a medium wherein the horizontally linked list further links at least the subset of the plurality of entities in an ascending rank order direction (col. 9 lines 25-40).
8. As per claim 6, Nolan teaches a medium wherein the plurality of ranks are equally distributed over the plurality of array entries (col. 9 lines 25-50).
9. As per claim 7, Nolan teaches a medium wherein the entity having the greatest rank within the corresponding range of ranks for each of one or more of the at least one array entry is one of a subset of the plurality of entities having the greatest rank within the corresponding range of ranks for the array entry (Fig 2, col. 9 lines 25-50).
10. As per claim 8, Nolan teaches a medium wherein at least one array entry of the plurality of array entries each points to null, corresponding to no entity within the plurality of entities having a rank within the corresponding range of ranks for the array entry (col 9 lines (col. 9 lines 49-64)).

11. As per claim 9, Nolan teaches a medium wherein each entity of the plurality of entities is a thread, the rank of the entity is a priority for the thread, and the array is a priority queue (col. 9 lines 34-40).
12. As per claim 10, Nolan teaches a method for removing a particular entity from a plurality of entities, each entity having a rank within a plurality of ranks, the method comprising: in response to determining that the particular entity is present within a vertically linked list linking in at least one direction a corresponding subset of the plurality of entities having an identical rank, the corresponding subset including the particular entity (col. 9 lines 29-40, col. 11 lines 12-20).

in response to determining that an array entry of a plurality of array entries of an array over which the plurality of ranks are distributed points to the particular entity, adjusting the array entry to point to one of null and another one of the plurality of entities (col. 9 lines 34-40). Nolan does not specifically teach the use of a horizontally/vertically linked list.

Glover teaches a method of determining that the particular entity is present within a horizontally linked list linking at least a subset of the plurality of entities in at least in a descending rank order direction, the subset including the particular entity (col. 49 line 59 –col. 50 line 13),

delinking the particular entity from the horizontally linked list and delinking the particular entity from the vertically linked list (col. 50 lines 62-67).

13. As per claim 11, Nolan teaches a method wherein the array entry has a corresponding range of ranks, and adjusting the array entry to point to one of null and another one of the plurality of entities (col. 9 lines 34-40). Nolan does not specifically teach the use of a horizontally/vertically linked list.

Glover teaches a method of determining that the particular entity was present within the vertically linked list, adjusting the array entry to point to a next entity within the vertically linked list (col. 49 line 59 –col. 50 line 13).

14. As per claim 12, Glover teaches a method wherein adjusting the array entry to point to one of null and another one of the plurality of entries further comprises, otherwise, in response to determining that the particular entity was present within the horizontally linked list, and that the rank of a next entity within the horizontally linked list is within the corresponding range of ranks for the array entry, adjusting the array entry to point to the next entity within the horizontally linked list (col. 49 line 59 –col. 50 line 13).

15. As per claim 13, Nolan teaches a method wherein adjusting the array entry to point to one of null and another one of the plurality of entries further comprises, otherwise, adjusting the array entry to point to null (col. 9 lines 49-64).

16. As per claim 14, Nolan teaches a method further comprising, in response to determining that a head pointer pointing to an entity having a greatest rank of the plurality of ranks of the plurality of entities points to the particular entity, adjusting the head pointer to point to another one of the plurality of entities (col. 9 lines 49-64).
17. As per claim 15, Glover teaches a method, wherein adjusting the head pointer to point to another one of the plurality of entities comprises, in response to determining that the particular entity was present within the vertically linked list, adjusting the head pointer to point to a next entity with the vertically linked list (col. 49 line 59 –col. 50 line 13).
18. As per claim 16, Glover teaches a method wherein adjusting the head pointer to point to another one of the plurality of entities comprises, otherwise, in response to determining that the particular entity was present within the horizontally linked list, adjusting the head pointer to point to a next entity within the horizontally linked list (col. 49 line 59 –col. 50 line 13).
19. As per claim 17, Nolan teaches a method, wherein each entity of the plurality of entities is a thread, the rank of the entity is a priority for the thread, and the array is a priority queue (col. 9 lines 40-50).

20. As per claim 18, Nolan teaches a method wherein the method is performed by execution of a computer program stored on a machine-readable medium by a processor (col. 3 lines 53-67).
21. As per claim 19, Nolan teaches a method for adding a new entity having a rank within a plurality of ranks to a plurality of entities also each having a rank within the plurality of ranks, the method comprising of a plurality of array entries of an array over which the plurality of ranks are distributed such that each array entry has a corresponding range of ranks, determining the array entry having the corresponding range of ranks in which the rank of the new entity lies (col. 9 lines 29-40, col. 11 lines 12-20);
- adjusting the array entry having the corresponding range of ranks into which the rank of the new entity lies to point to the new entity in response to determining that the array entry currently points to null (col. 9 lines 29-40, col. 11 lines 12-20);
- adjusting the array entry having the corresponding range of ranks into which the rank of the new entity lies to point to the new entity in response to determining that the array entry current points to an entity having a rank less than the rank of the new entity (col. 9 lines 29-40, col. 11 lines 12-20). Nolan does not specifically teach the use of a horizontally/vertically linked list.

Glover teaches a method of linking the new entity into a vertically linked list linking in at least one direction a corresponding subset of the plurality of entities having an identical rank, in response to determining that the rank of the new entity is equal to the rank of any other entity within the plurality of entities (Fig 12-1, 12, 2, 12-3, 12-4, col. 6 lines 57-67, col. 49 line 59 –col. 50 line 13); and

otherwise, linking the new entity into a horizontally linked list linking at least a subset of the plurality of entities in at least a descending rank order direction, each entity in the horizontally linked list having a unique rank as compared to the ranks of other entities in the horizontally linked list (Fig 12-1, 12, 2, 12-3, 12-4, col. 6 lines 57-67, col. 49 line 59 –col. 50 line 13).

22. As per claim 20, Nolan teaches a method, further comprising adjusting a head pointer pointing to an entity having a greatest rank of the plurality of ranks of the plurality of entities to point to the new entity in response to determining that the rank of the new entity is greater than the rank of the entity of the plurality of entities to which the head pointer currently points (col. 9 lines 35-50).

23. Claims 21-22 are rejected based on the same rejections for claims 18-19 above.


Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nilesh R Shah whose telephone number is 703-305-8105. The examiner can normally be reached on Monday-Friday 8am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng An can be reached on 703-305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NS
April 28, 04


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